

**AUTOMATIC CONTROL and COMPUTER SCIENCE Section**

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A Modular Social Networking Framework Using Cloud Resources  
*Vlad-Alin Iacob and Adrian Alexandrescu*



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Nowadays, computer social networking is an important aspect of everyday life, especially for young people, and, with the rapid increase in the number of users of such networks, there is the need for a high volume of computational and storage resources. Thankfully, there are many cloud-based solutions that are capable of handling large social networks. This paper proposes the means of developing a social network by using a flexible and modular approach that is based on cloud resources for data storage, publishing and sharing application messages between users. Besides the user communication characteristics of traditional networks, the proposed framework integrates location monitoring capabilities by using the GPS, Wi-Fi or GSM components specific for the device that the application is launched on. Also, it is highlighted the importance of working on modules, the use of object oriented programming concepts and user-sensors specific devices without using native and platform dependent applications.

Key words: social network, framework, module, Cloud.

2010 Mathematics Subject Classification: 68N19, 68M10

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## Solution of Mixed Type Transportation Problem: A fuzzy Approach *Nizam Uddin Ahmed, Aminur Rahman Khan and MD. Sharif Uddin*



[Full text](#)

Many researchers solved transportation problem (TP) where all the data are either fuzzy or real numbers. None try to solve TP when the data are in mixed type. In this paper, we develop a new algorithm for finding an initial basic feasible solution of a TP when the transportation matrix contains both fuzzy numbers and real numbers. The solution procedure is also explained with a numerical example.

Key words: FTP; Trivial Trapezoidal Fuzzy Numbers; Robust's ranking function.

2010 Mathematics Subject Classification: 90B50, 90C08, 03E72.

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## Real-Time Object detection Based on Dual Stochastic Backgrounds with Adaptive Learning Rates *Lavinia Fierariu and Emilian Boghian*



[Full text](#)

This paper presents an approach for real-time tracking of non-rigid objects in streams with dynamic background. It considers the formalism of background subtraction based on a mixture of Gaussians distributions, which is widely recommended for solving illumination disturbances at reduced computational costs. Commonly, adaptive background maintenance is adopted for alleviating the detection of objects with wide range of speeds. However, the adaptation of a single background model, controlled by a single learning rate can fail if the same frames include both sleeping and fast foreground objects, or some fast objects have uniformly coloured regions which could be easily misinterpreted as static. In order to solve these issues, this paper considers two background models updated in parallel with distinct, adaptive rates. The first contribution refers to cross-validations performed on the two resulted foregrounds, which authorise deletions or reunions of the detected items. Supplementary, the paper introduces a procedure which exploits the results of the cross-validations for adapting the learning rates associated to each background model. The advantages of the suggested approach are illustrated on streams exemplifying sudden changes of the foreground, sleeping objects and foreground aperture.

Key words: motion detection, foreground detection, background subtraction, mixed Gaussian distributions.

2010 Mathematics Subject Classification: 65D18, 68U10.

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## Allocating Accommodation in a University Campus *Andrei Scutariu and Adrian Alexandrescu*



[Full text](#)

In every university campus there is the need to efficiently allocate accommodation to students belonging to different faculties. This paper looks at the practical implications of the allocation process and proposes an approach that helps the secretary of a university to assign places to faculties based on configurable parameters and percentages. The considered parameters resulted from analyzing all the uses-cases that occurred in the campus of the “Gheorghe Asachi” Technical University of Iași. The proposed solution offers a flexible allocation tool for a university, and it provides the means to manually adjust the results and also to issue comprehensive reports for each faculty.

Key words: accommodation allocation, university campus.

2010 Mathematics Subject Classification: 68U35.

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## Predictive Control of an Anaerobic Digestion Process *Florin Stîngă and Emil Petre*



[Full text](#)

We proposed a predictive control strategy in order to control the concentration of the volatile fatty acids, an organic compound of the aerobic digestion process. Based on the linear approximations of the original nonlinear model, an optimal control algorithm was developed. The predictive control is an advanced control technique of the processes under operating constraints and uncertainties. The simulation results validate the effectiveness and robustness of the proposed algorithms.

Key words: aerobic digestion process; volatile fatty acids concentrations; chemical oxygen demand concentration; model predictive control.

2010 Mathematics Subject Classification: 34H05.

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## A Competent Algorithm to Find the Initial Basic Feasible Solution of Cost Minimization Transportation Problem

*Aminur Rahman Khan, Adrian Vilcu, MD. Sharif Uddin and Florina Ungureanu*



[Full text](#)

In this paper, we propose a new algorithm along with MATLAB 7.7.0 code for determining the initial basic feasible solution of Cost Minimization Transportation Problem (CMTP). Comparative study is carried out between the proposed algorithm and the other existing algorithm by means of sample examples which shows that the proposed algorithm provides better result.

Key words: Cost minimization transportation problem; MATLAB; Distribution indicator; Optimum solution.

2010 Mathematics Subject Classification: 90B50, 90C08.

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